

REMARKS

1. Introduction

Applicants have amended claim 3. Accordingly, claims 1-19 are presently pending in the above-identified application. Reexamination and reconsideration is hereby respectfully requested.

2. Claim Rejection Under 35 U.S.C. § 112

Claim 3 is rejected under 35 U.S.C. § 112, second paragraph. Applicants have overcome the rejection through appropriate amendment. No new matter has been added. Reconsideration and withdrawal of the rejection is hereby respectfully requested.

3. Interpretation of Elton et al., U.S. 5,036,165

As an initial matter, Applicants understand the Office Action to mean that the Examiner is reading Elton et al. ('165) as disclosing a particular type of electrical cable used as a winding in a dynamoelectric machine (*i.e.*, the Office Action states that "Elton et al. ('165) disclose the claimed invention except . . .", and the claimed invention recites, among other things, "a rotating electric machine comprising a rotor, stator and windings.")). For the reasons to appear hereinafter, Elton et al. ('165) does not disclose that the electrical cable shown in Figure 1 thereof may be used for windings in a dynamoelectric machine. Rather, the conductor shown in Figure 1 of Elton et al. ('165) is used only for an electrical transmission and distribution cable.

Elton et al. ('165) is a divisional of what is now issued U.S. Patent No. 4,853,565 (Elton et al. ('565)). As stated in column 1, lines 5-9 of Elton et al. ('165), the '565 patent is incorporated by reference in its entirety into Elton et al. ('165). A photocopy of Elton et al. ('565) is attached to this *Amendment and Reply* for the Examiner's convenience.

Therefore, although not reproduced expressly in Elton et al. ('165), the Elton et al. ('165) patent must be construed as if all of the text and drawings in Elton et al. ('565) were expressly included in and reproduced in Elton et al. ('165).

In turn, Elton et al. ('565) disclose generally a semi-conducting layer for insulated electrical conductors in three distinct embodiments. The first embodiment (Figures 1-6) deals with windings in a dynamoelectric machine. With regard to this first embodiment in Elton et al. ('565), the conductors in the dynamoelectric machine are referred to exclusively as "windings" or "bars." The second embodiment (Fig. 7) relates to an electrical cable of the type used for carrying (*i.e.*, transmission of) high voltage. With regard to the second embodiment, the conductor is referred to exclusively as a "cable" and **not** a "winding" or "bar." The third embodiment (Fig. 8) relates to use of a semiconductor layer disposed on an electrical housing surrounding digital electronic equipment. The conductor in the third embodiment is referred to exclusively as a "housing," and neither a "cable" (for transmission and distribution) nor a "winding" (for use in a dynamoelectric machine). Applicants have carefully reviewed Elton et al. ('565) and have found no variance from the choice of terms used in Elton et al. ('565).

With the foregoing as background, it follows that the mention in Elton et al. ('165) to a "dynamoelectric machine" was in all likelihood inadvertent (*i.e.*, that term was not deleted when the divisional was filed on the "cable" embodiment). In any event, however, why such mention to a "dynamoelectric machine" remains in the Elton et al. ('165) patent is fairly immaterial, since, as described above, the entire contents of the Elton et al. ('565) patent are incorporated by reference into the Elton et al. ('165) patent. When all of the disclosure is taken together, as it must, it is clear that the conductor designated 100 in Elton et al. ('165) relates only to an electrical cable for transmission and distribution of electrical power, and not to a winding for a dynamoelectric machine. Any other interpretation, Applicants submit, would be contrary to the plain meaning given to the words as defined in the Elton et al. specification.

4. **Claim Rejection Under 35 U.S.C. § 103**

Claims 1 and 6-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Elton et al. (U.S. 5,036,165) in view of Gasparini et al. (U.S. 5,729,068). Applicants respectfully traverse this rejection for at least the following reasons: (i) there is no proper basis to support the combination of the references, and (ii) even were it proper to make the combination (which it is not), not all of the recitations in the subject claims would be met.

Concerning the propriety of the combination itself, the Examiner has stated in the Office Action that:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the winding arrangement as taught by Gasparini et al. to the winding cable as disclosed by Elton et al. since such a modification according to column 1, lines 3-68 of Gasparini et al. would provide *an arrangement that is simple and economical to produce*. (emphasis added).

It bears emphasizing that the burden is on the Patent and Trademark Office to establish a *prima facie* case of obviousness when rejecting claims under 35 U.S.C. § 103. When based on a combination of references, the art itself must teach, suggest, or provide an incentive to support the combination:

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, *absent some teaching, suggestion or incentive* supporting the combination. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

In Re Geiger, 815 F2d at 688, 2 USPQ2d at 1278 (Fed. Cir. 1987) (emphasis added). For the reasons to appear hereinafter, the Office has not met the above-quoted standard for establishing a *prima facie* case.

No Disclosure of Cable 100 as a “Winding” in a Dynamoelectric Machine

As discussed above, Applicants respectfully contend that the starting point in the Examiner’s train of reasoning as stated in the Office Action (*i.e.*, that “Elton et al. disclose the *claimed invention* except . . .”) is incorrect. Accordingly, the remainder of the reasoning set forth in the Office Action in support of the combination therefore fails. Applicants cannot see nor has the Examiner stated how one would otherwise arrive at the basic starting point (*i.e.*, that cable 100 is used as a “winding”) absent an express disclosure in Elton et al. (‘165). While Applicants contend that there is no logic to support using the transmission cable of Elton et al. (‘165) as a “winding” in a dynamoelectric machine, it is not incumbent on Applicants to try to come up with such reasoning – essentially a case of arguing against themselves. Such burden is on the Patent and Trademark Office.

Notwithstanding the foregoing, Applicants point out that the Elton et al. (‘565) patent (incorporated by reference) fails to describe the use of cable 100 as a winding in a dynamoelectric machine even as a remote possibility. This is a particularly substantial omission, particularly when a dynamoelectric machine was described elsewhere in the patent.

No Motivation to Combine

Notwithstanding the foregoing, should the Examiner disagree with Applicants’ interpretation of Elton et al. (‘165) (through incorporation of Elton et al. (‘565)), Applicants offer, in order to achieve compact prosecution, the following in support of patentability. The Examiner has stated that the reason it would be obvious to modify Elton et al. (‘165) with the teachings of Gasparini et al. is that it would provide “an arrangement that is simple and economical to produce.” The terms “simple” and “economical” are relative terms, and must be understood to be taken in reference with a baseline structure or approach. Gasparini et al. teach that the baseline structure is a prior art insulation cap for connected end windings. It is the improved “soldering lug insulation” of Gasparini et al. that is “simple and economical to produce” relative to the prior art insulation cap approach. Perhaps the reasoning stated in the Office Action would have some force if the structure in Elton et al. (‘165) exhibited a

problem that could benefit from the solution of Gasparini et al. However, such is not the case. Whatever else can be argued to be taught by the obviously inadvertent mention of “dynamoelectric machines,” it is beyond disagreement that Elton et al. (‘165) is clearly *silent* as to how such a cable 100 could be used as a “winding” in a stator of such a dynamoelectric machine. Given the wide variety of ways a stator of a dynamoelectric machine may be organized, a fair reading of Elton et al. (‘165) is that it does not teach any particular stator winding arrangement, much less the type having bar ends with soldering lugs or the like that would exhibit the kind of problem that could be solved by the solution in Gasparini et al. For a proper basis to exist for applying Gasparini et al. to Elton et al. (‘165), it must disclose or suggest a suitable problem to be solved, or an advantage to be gained. The reference to be modified is Elton et al. (‘165). Elton et al. (‘165) does not disclose a need for the improvement of Gasparini et al. Accordingly, adding the teaching does nothing but increase cost, and may even adversely affect function.

In summation, the reasoning set forth in the Office Action assumes, without support, that a problem is disclosed in Elton et al. (‘165) or, that a problem can be inferred from the structure disclosed in Elton et al. (‘165) such that it would make sense to apply the solution set forth in Gasparini et al. As discussed above, whatever can or cannot be said of the mention of a dynamoelectric machine in Elton et al. (‘165), it remains silent as to how the cable 100 could be used as a “winding” generally, and particularly of the type that could benefit from the structure of Gasparini et al. Reading any more out of Elton et al. (‘165) is pure speculation, and is unsupported.

Accordingly, since there is no teaching, suggestion, or incentive in the art that supports the modification, Applicants respectfully submit that the Office has impermissibly used Applicants’ own disclosure to hunt through the prior art for needed elements and combine them, as claimed.

Even as Combined, Not All Limitations Met

In addition, even assuming for purposes of argument only that it is proper to modify Elton et al. ('165) using Gasparini et al. (which it is not), not all of the limitations of the claims would be met. For example, claim 1 recites, in-part, "at least one winding arranged in such a way that the end windings comprise layers crossing each other." Neither Gasparini et al., nor Elton et al. ('165), teach or suggest the quoted recitation. In this regard, the Examiner's attention is respectfully directed to column 2, lines 24-28 of Gasparini et al.:

In FIG. 1 two stator winding bars 1, 2, which emerge from different slots of a stator laminated body (not illustrated) of an electric machine, are electrically and mechanically connected to one another by means of a soldering lug 3. (emphasis added).

While Applicants consider the wording "crossing" to be construed very broadly, to read such language on the disclosure of Gasparini et al. is contrary to the plain meaning given by Applicants. For example, in the specification of the present invention, page 3, lines 30-34, Applicants, when referring to the *prior art* used "connected" not "crossing": "what is special for the winding [of the prior art] is that it comprises two so-called half-windings connected in series." On the other hand, Applicants, when referring to their own invention, used "crossing" to describe windings that may touch but are not "connected" in the manner of the prior art:

Another advantage is that the design of the insulation system will make it possible to arrange the layers of the windings more freely. At the end windings it is possible to let the layers cross each other and to mix layers of windings with different voltage. This makes it possible to make the machine more compact, even though it comprises several layers of windings. (emphasis added).

Page 5, lines 23-30 of the present specification.

Applicants therefore respectfully submit that the Office has ascribed an unreasonable definition to the recited word “crossing,” in view of the art, and the specification of the present invention.

In addition, claim 1 recites, in-part, a “flexible” conductor. Applicants respectfully submit that the cable disclosed in Elton et al. (‘165) is quite inflexible. This is because the pyrolyzed glass fiber layer is stiff and brittle. This is more than just an academic difference relative to Applicants’ invention. Because of this stiffness and brittleness, the cable of Elton et al. (‘165) could not in-fact be used as a winding in a dynamoelectric machine. The Elton et al. (‘165) cable would crack, producing partial discharge paths through the pyrolyzed glass fiber layers. In addition, the brittleness of the cable of Elton et al. (‘165) is fatal. The inability of such a cable to withstand the high mechanical forces and vibration expected to occur in a high voltage rotating electric machine (see Applicants’ specification, page 5, lines 31-38, and page 6, lines 1-11) would lead to partial discharge as described above and possibly failure.

The foregoing paragraphs focused on particular language of claim 1 that would not be met, even assuming it were proper to combine Gasparini et al. and Elton et al. (‘165). Concerning the differences between the prior art and the claims at issue, it is essential to view the claims in issue as the invention as a whole, as required by 35 U.S.C. § 103. In this view, it is therefore impermissible to ignore the advantages, properties, utilities and unexpected results flowing from the claimed invention; they are part of the invention as a whole. In Re Chupp, 816 F2d 643, 2 USPQ2d 1437 (Fed. Cir. 1987). There are multiple advantages, as stated in Applicants’ specification, page 5, lines 15-30, one advantage of the claimed invention is that the voltage of the machine can be increased to such levels that it can be connected directly to the power network without an intermediate transformer. Another advantage is that the design of the insulation system makes it possible to arrange the layers of the windings more freely, making it possible to make the machine more compact even though it comprises several layers of windings. Applicants cannot see, nor has the Office suggested, how such advantages can be achieved by the combination of Gasparini et al., and Elton et al.

(‘165). A conventional end winding arrangement set forth in Gasparini et al. (bar connections that substantially project from the stator) would make it difficult if not impossible to achieve the above-stated advantages, since large numbers of layers could not be arranged relative to each other in a compact manner.

For at least the foregoing reasons, it is respectfully submitted that claim 1 defines novel and non-obvious subject matter over the art of record. Applicants therefore respectfully request that the rejection be reconsidered and withdrawn.

Dependent claims 6-9 include all of the limitations of base claim 1, and therefore, for at least the same reasons set forth above, the rejection of claims 6-9 is improper, and Applicants respectfully request that it be reconsidered and withdrawn.

5. Rejection of Claims 2-5 and 10-19 Under 35 U.S.C. § 103(a)

Claims 2-5 and 10-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Elton et al. (U.S. 5,036,165) in view of Gasparini et al. (U.S. 5,729,068) and further in view of Cooper et al. (U.S. 4,618,795). For at least the following reasons, Applicants respectfully traverse this rejection.

As contended above in connection with claim 1, it is improper to combine Gasparini et al. and Elton et al. (‘165) in the manner set forth in the Office Action. Accordingly, by force of logic, the combination of Elton et al., Gasparini et al., further in view of Cooper et al. cannot be properly supported due to failure of the more basic combination of Elton et al. (‘165) and Gasparini et al.

In addition, even were such a combination as set forth in the Office Action proper (which it is not), not all of the limitations of the claim would be met. Claim 10, for example, recites, in-part, “end windings form layers *crossing each other and coming into contact* and positioning means for securing portions of the cable in the layers in fixed positions in order to prevent fretting contact” None of the references teach or suggest the above-quoted recitation. Gasparini et al. disclose end windings that are “mechanically and electrically connected,” as discussed above in connection with claim 1. Gasparini et al. therefore do not

disclose “end windings form layers crossing each other.” Neither do Cooper et al. disclose end windings “coming into contact.” Cooper et al. clearly disclose that the ending windings are spaced apart. The “coming into contact” recitation is important in achieving one of the stated objects of the invention, namely, that of making a machine “more compact” (Applicants’ specification page 5, lines 28-30). Moreover, none of the references, including Cooper et al. in particular, teach or suggest the recited “positioning means.” The recited positioning means permits a selected permissible amount of non-sliding *relative* movement between the cables. The arrangement in Cooper et al., on the other hand, performs a different function, namely, that of uniting the two stator winding ends for movement together relative to the stator, not relative movement between the winding ends themselves. In this regard, the Examiner’s attention is respectfully directed to column 4, lines 8-12 of Cooper et al.:

The result is a physically united assembly of coils 14a and 14b with brace top piece 40 that is free to move axially due to thermal effects and with the brace bottom piece 40 to end bracket 22 keeping radially movement to a minimum.
(emphasis added)

For these reasons, independent claims 10 and 19 define novel and non-obvious subject matter. Accordingly, the rejection is respectfully requested to be reconsidered and withdrawn.

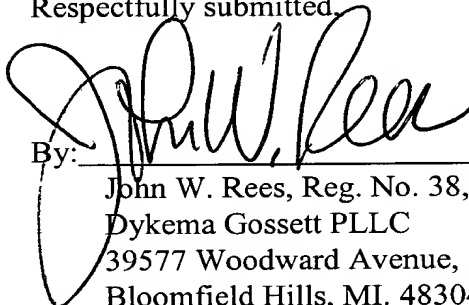
Dependent claims 11-18 depend from base claim 10 and therefore include all of the limitations described above. Accordingly, for at least the same reasons given above, dependent claims 11-18 define novel and non-obvious subject matter. Dependent claims 2-5 recite similar subject matter. The rejection of claims 2-5, and 10-19 is respectfully requested to be reconsidered and withdrawn.

66,291-140 (ABB Ref: 8027)
09/194,567

6. **Conclusion**

For the foregoing reasons, all presently pending claims are now believed to be in a condition for allowance. Early notice of the same is hereby respectfully requested.

Respectfully submitted,



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Version with Markings to Show Changes Made

3. (Twice Amended) A rotating electric machine according to claim 2, wherein the positioning means comprises a resilient layer comprising resilient material located in a contact area between two layers and a securing device, mutually securing the two layers, such that the resilient layer permits a certain permissible amount of relative non-sliding movement between the layers due to skewing of the resilient material in the contact area, said resilient material having a thickness sufficient to accommodate the permissible relative movement.